$1 A YEAR 10 CENTS A COPY

AMERICAN JOURNAL OF PHOTOGRAPHY

AN ILLUSTRATED MONTHLY
DEVOTED TO PHOTOGRAPHY
IN ITS WIDEST SENSE

Vol. XIX JUNE, 1899 No. 222

CONTENTS

PHILADELPHIA
AUSTIN C. LEEDS, Publisher
817 FILBERT STREET

NEW YORK: For Sale at BRENTANO'S, 31 UNION SQUARE

ONIATCHEWAN—NEAR LAKE ST. JOHN, QUEBEC WALTER P. STOKES

AMERICAN JOURNAL
OF
PHOTOGRAPHY

AUSTIN C. LEEDS, Publisher
JOHN BARTLETT, Editor

Issued on the 15th of Each Month

Subscription Price . . . . . $1.00 a Year
Foreign Subscription . . . . . 1.50 " "

ENTERED AT THE PHILADELPHIA POST OFFICE AS SECOND-CLASS MATTER

VOL. XIX. JUNE, 1899. No. 222.

PRINT COMPETITION

THE publishers of the AMERICAN JOURNAL OF PHOTOGRAPHY, with the view of arousing an interest among its readers for the production of artistic work, have decided to offer a series of monthly competitions, beginning with the August issue of the Journal.

	CLOSING DATES	CLASS
No. 1.	July 20th,	Water pictures (not seascapes).
No. 2.	August 20th,	Landscapes.
No. 3.	Sept. 20th,	Animal pictures.
No. 4.	October 20th,	Seascapes.
No. 5.	Nov. 20th,	Interiors.

All subscribers to the AMERICAN JOURNAL OF PHOTOGRAPHY are eligible in the competition. The decision

as to the merits of the pictures will be made by an acknowledged authority on technical photography, and also by two well-known artists.

The criticisms of the awarded pictures will be published in the AMERICAN JOURNAL OF PHOTOGRAPHY.

THE AWARDS

1st,	Ten Dollars	($10.00)
2nd,	Five "	($5.00)
3rd,	Three "	($3.00)

RULES AND CONDITIONS

All prints must be mounted, with the name of the competitor written on the back of the card. Title may be placed on front.

The number of prints submitted shall not exceed two for any one sender.

No prints previously awarded prizes will be admitted.

Each contestant must be a subscriber to the AMERICAN JOURNAL OF PHOTOGRAPHY. Subscription may accompany the entry of the prints.

Prints must be sent fully postpaid.

When the sender desires return of prints, stamps must be enclosed: otherwise the prints will not be returned.

Awards will be made in each case on the 15th of the month following entry.

FIGURES ON THE RECTANGLE

J. B.

WHEN the photographer puts his head under the cloth, he at once perceives that there is a certain space to to be filled, bounded by four rigid lines, and though he is conscious that he has not the same freedom in selection as the painter, he knows and appreciates the truth that much depends upon his ability to adjust the parts, if he wishes a harmonious relation of the individuals.

His great desire, if he has any artistic perception, is to fill up that rectangle to the best advantage. He knows the easiest way to do it is to arrange the figures or elements one after the other in a file, much in the manner of the mural paintings of the Ancient Egyptians; but then, he is fully aware that such a disposition involves neither skill nor thought.

Much experience or inborn aptitude is required, combined with taste and judgment to so dispose of figures in a group as to produce pleasing variety in the attitudes.

There are certain general principles which have come to be accepted by the masters as applicable to figure composition, and these the photographer may make use of, but not blindly follow them.

Whatever the subject of the picture may be, the eye is always first attracted to the heads. It is, therefore, of the greatest importance to carefully consider their relative positions.

The heads of a group should never be equidistant, or so placed that imaginary lines connecting them would form any regular geometric figure, as an arc, circle, square, or triangle.

Such a distribution is about as offensive to the trained eye of the artist as the all-in-a-row arrangement.

By simply shifting the position of the figures, it is easy to break up this unpleasant symmetry.

Two heads should never be in the same vertical line—that is, one perpendicularly below the other. Suppose we have two figures: one standing, the other kneeling or sitting—it will give greater action to the group and more pleasure to the eye by bringing the head of the kneeling figure a little in advance of the standing one. If we have three figures to dispose of—two standing and one sitting—we should not arrange the group so that the sitting figure shall be equidistant from the standing ones.

Converging lines, in a group, are generally objectionable, unless the convergence is necessary to the subject depicted. Where all the arms seem to radiate from one fixed point as a centre, the eye naturally turns to that point, and when it finds there is nothing of interest, is naturally disappointed and the group affords no pleasure.

The management of the arms and hands, especially in a large group, is one of the most difficult things to deal with. They cannot be put out of sight, but should be so disposed as not to attract special attention. Sometimes in a group the arms and hands cross, but they should never cross at right angles, and it should be remembered that obtuse angles in a picture are more pleasing than acute. Repetition of lines is generally to be avoided, although sometimes the repetition of the same attitude, in a minor key, is quite effective by way of emphasis.

The art of grouping cannot be learned without considerable experience.

At first one has a general idea how the space is to be filled, then the details have to be worked up and a change in attitude may require a corresponding change in some or all of the others, until the original idea is abandoned for something else quite unexpected at the start and far more pleasing.

A casual movement on the part of one or more of the figures may suggest an idea which, worked out, may be delightful.

The principle figure of the group, that about which the others centre, what we might call the hero of the piece, should, like its analogue in the novel, receive the most attention and suggest the intention of the artist, but it is not necessary to place it in the centre of the picture, nor need it receive the greatest illumination. Unless the secondary or less important figures of the group are so arranged as to show their relation to the leading figure, they will seem like trespassers upon the scene—a lot of individual photographs taken upon the same plate. Too many groups are of this stamp. Isolate by covering up the others, any one of the group, and in the majority of cases it will be found that he or she is posing for the best personal expression, regardless of the harmony of relations. But photographers are not the only artists who sin in this particular. A great many paintings look as if the characters were conscious that the cap is now off the lens—quiet all! one second only!

Now, one word as regards the size of the figures, with reference to the dimensions of plate. They should not be so large as to look cramped in the space allotted them; sufficient room being given the seated or stooping figures to arise if they felt so inclined. The impression should never be conveyed that they would thereby

endanger their heads by coming in contact with the top of the plate. The beggarly amount of space accorded sometimes within the four lines of the trimmed print must be stifling to the figure. It reminds one of a mummy in a sarcophagus.

On the other hand, the actors in the piece should not be so diminished in proportions as to look like a stage representation—a tribe of liliputians.

Finally, take care not to crowd the scene with too many items of interest, so that the observer may be able, mentally, to make out of the composition a half dozen other pictures. It is often a temptation to fill up an empty space, but frequently it is better to be satisfied with the emptiness, unless you have the genius of a Hogarth or Reubens for managing crowds.

CHEMICAL DIRT

FLAVIUS

SOMEONE has defined the term "dirt" as anything out of place, and, though the definition will scarcely bear logical analysis, no one, I suppose, being willing to grant that the misplaced pearl of the well-known proverb, though pre-eminently out of its proper environment, should be accounted dirt; yet chemical dirt is very frequently something out of place. By way of example: suppose a glass graduate, which has been used for mixing chloride of gold for the toning bath, be employed to measure the amount of water for the hypo solution; the gold traces, being of no use to the hypo bath, would be out of place, but could not, therefore, chemically be called dirt, because its presence would not be accounted obnoxious. And, the photographer who so used the glass would neither be called careless nor accused of want of cleanliness, but if the hypo measure should be used to supply water for the toning bath, the hypo which adheres to the glass would be out of place in the gold bath and would be dirt of the worst kind.

The first lesson that a photographer should learn should, therefore, be to find what ought to be clean and the method of cleaning it.

The exchequer of most photographers is not large enough to

have dishes and measures in such number that each may be devoted to its special use. An interchance of dishes is unavoidable in the excitement of work or experiment, and no danger is incurred of contamination by chemical dirt if care is taken, on completion of the operation, to thoroughly cleanse the vessel before employing it for the next course of manipulation. I know a photographer who has only one very large porcelain dish, which he uses for all purposes, from the developing of the negatives to the fixing of the prints. His results are never interfered with by the out-of-place chemicals, because he carefully washes after each operation. Plain water and a hasty rinse will not always evict the undesired lodger in the flask or dish. A more vigorous treatment is often necessary. Washing soda and hydro-chloric acid will be found very useful in removing rather persistent dirt, and, if friction is necessary, a little clean sand may be added. Dousing water in a bottle and merely turning it upside down, far from cleaning it, really facilitates the deposit of matter on the sides. The water flowing out of a narrow-neck of an inverted bottle proceeds slowly, and it is necessary to keep it in motion by shaking and twirling.

These suggestions may seem trivial, but it is safe to say that inattention to the demands of chemical cleanliness is responsible for the major part of the failures or indifferent work which beginners encounter.

Using brushes whose bristles come out, to dust off the plate, or using dusters which are allowed to lie around anywhere, is a cause of streaks or unaccountable phenomena in the negative.

Even a too emphatic brushing of the plate, before insertion in the holder, may cause dust in the atmosphere to be attracted electrically to the surface and load the negative with pin holes. Using chemically dirty blotters (blotters bleached with hypo) may be the cause of your prints looking out of sorts.

A glass stirring rod is a dark-room necessity, but an unwiped rod will create unlooked-for effects, and may lead to a discovery in your results not always worth giving to the public. Though, by the way, it was some mercury, chemical dirt, in the cabinet of Daguerre, which had spilled upon the shelves, that gave the world the developer of the latent image on the silver film.

Enamelled dishes, when the enamel has cracked off, are neucleii for the deposit of chemical dirt in the shape of iron rust.

Never get the wrong stopper or cork in the bottle—for a stopper so placed is out of place, and hence, dirt.

The purity of the chemicals themselves is a question to be considered, it is true, but nowadays chemicals can rarely be blamed justly for failure. It is more probable that mishaps occur from contamination of the chemical in the dark-room—or, in the adoption of some of the absurd formulæ recommended in the photographic magazines. One is often amused, though sometimes indignant, with the directions which are so gratuitously given in good faith, for the successful compounding of toning solutions, developers, etc. The little grain of gold or platinum in the toning bath, which really does all the work, is compelled to carry along with it an unnecessary load of sometimes inert, but often hurtful chemicals—acetates, phosphates, chlorides and what nots.

Still it must be confessed that some very useful formulæ have been evolved by practical men in the profession, which, on their first publication, were pounced upon and derided for their absurdity. But time rectified and honored them, so that one must needs hasten slowly in denouncing what looks theoretically ridiculous or chemically absurd.

But we think enough has been said in this paper on the subject, and the writer trusts that what he has said may not be considered out of place and brushed from the reader's consideration as something altogether unnecessary.

AMERICAN JOURNAL OF PHOTOGRAPHY.—Praise of any special article in this were impossible, all being good, instructive and readable. The first on "Composition in Lines and Forms," is a careful analysis of the subject, dealing with perspective and focus, unity and grouping. An historical article on child pictures, with illustrations reduced from pictures by great painters, as Van Dyke, Reynolds and others is particularly interesting both to photographer and student. Other articles on portrait posing, copying engravings and oil paintings, composite landscape, and fixing prints (which we reprint on another page) are all worthy of careful perusal. We are pleased to welcome the reappearance of this Journal which for some time was dormant, and venture to predict that if the excellence of the part to hand is maintained the new management have a prosperous future before them.—*The Australian Photographic Journal.*

PHOTOGRAPHING ANIMALS

THE ideal, as it relates to beauty of form, is far from being always removed from the matter of fact. It is only when representations are made of the human figure that a departure from the exact proportions and shape of the individual model becomes necessary.

The accidents which tend to impair the beauty of humanity

Flash-Light Picture JOHN BARTLETT

are so much more numerous than those which affect any other animal forms that perfect beauty of face and figure can never be found in man or woman. The wearing of clothes soon impairs the beauty of infantile forms. No leg or foot can long remain unspoiled by shoe or garter. Luxury, injurious habits, and the various employments of civilized life contribute to the injury of whatever beauty the individual may have had by birthright.

The lower animals living in a state of nature have preserved their characteristic forms of beauty, and need no idealization when represented in art.

The horses in the Elgin Marbles are the closest possible copies of well-chosen living specimens, and in all natural forms, excepting man, it is easy enough to meet with specimens of which if the greatest painters can only transfer to canvas literal copies they consider themselves fortunate.

The chief excellence of these Greek sculptures depends on their having been copied direct from nature and not from imagination.

The communication of art with nature is here, everywhere, immediate, entire, palpable.

Great as Flaxman's Sculptures are the conventional and unnatural forms of some of the representations of the inferior animals is often very glaring.

The eagle by the side of Jove in his outline reliefs of the Iliad is merely heraldic in its form; and the same may be said of his lions, oxen, and sheep in other designs. Even his horses have the conventional figure and expression almost human which strike us so palpably in the horses of Raphael and other painters of the Renaissance.

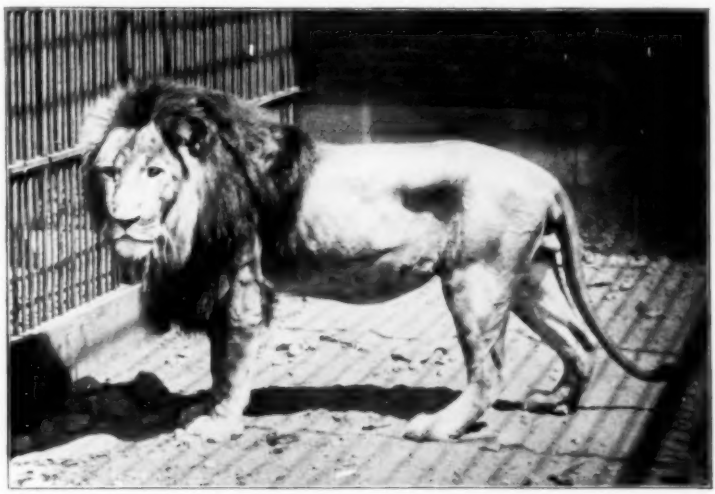
Thorwaldsen in his sculptures idealized his animals, but doubtless he intended them to be symbolical, for some of the outlines of dogs in his groups are remarkably life-like and evidently direct from nature.

One needs hardly be told how much license is allowed even the great painters in the delineation of animals, especially animals in motion. Not that we would have the contortions revealed by the drop-shutter exposures, but it is unquestionably asking us to idealize too much when so great a painter as Fromentin makes the body of a horse in his picture of the "Falconier" nearly one-third again as long as nature, and the hind quarters stretched out behind instead of being compactly knit together.

But we do not forget such painters of animal life as Meissonier, DeNeuville and Detaille. Compare the Greek horses with the lions of Trafalgar Square, the work of the great Landseer. These latter absolutely miss the true sculptural quality which distinguishes the leonine pose, and besides a lion couched like that has not a concave back like a greyhound, but a convex back,

greatly ennobled in line it is true but almost identical with a cat's back in the same position.

The earliest known picture of an animal is the representation of the mammoth by the cave-man draughtsman: and we might follow up historically with the basalt and porphyry lions of Egypt and Assyria, the Chinese and Japanese birds, beasts, and fishes, but the subject is too prolific and might lead us afield, and we have touched upon this province of art merely to direct the photographer or the photographic artist to the rich store of possibilities for picturesque and beautiful conceptions which may



African Lion—Phila. Zoo WM. H. RAU

be found in the conscientious study of animal forms which the camera presents.

Look for instance at a well decorated Japanese fan. They say the artist takes his fan or screen and lays upon it with unerring hand where and how he chooses, and with no guiding rule, the shape of some bird, beast, fish, plant, or flower. But that shape is almost always as near as possible to the particular species of bird, beast, fish, plant, or flower he wants to represent, and it is so placed or posed that it is there for a purpose. It is not a hieroglyphic for a plant or animal, nor is it imaginary, fanciful, or conventional.

The secret of true animal painting is going to nature direct for what is wanted. Even if the grotesque is wanted, nature will furnish it. Some of the great pythons or iguanas are more truly what Ruskin would call true grotesque than the dragons and gargyoles of art.

Even for purposes of decorative art the animal world supplies endless variety of form and color, the graceful, the unexpected, the beautiful, if we would only use our eyes and not go on factoring with the elements of decorative art of the Greeks and the Middle Ages.

But we must now come to the practical work of the camera, and show that besides the necessity for artistic study of animal forms, there is demanded of the photographer technical skill.

It is necessary to study the animal in its characteristics—those special features of its nature which define it as belonging to the species it represents. It is a common belief that the photograph of an animal means the reproduction of head, tail, four feet, and all that there demesne is. A mere head is often all that is needed to make a picture.

It must be studied with the same care as the human animal to give it a charm which will attract and please. Animals are capable of assuming most graceful poses if taken under natural conditions and not subjected to the absurd and often cruel means resorted to to give them what is called a spirited expression. It is not often that we are able to get pictures of the wild life of animals, but recently we have been treated to several valuable illustrated papers of animals at home in *Bird Lore*, which are not only beautiful from an artistic point, but most important in the study of natural history.

In the Zoological Gardens the dens in which the animals are confined are seldom well lighted so that sometimes a second or two is necessary for the exposure, and one's patience is called in requisition in watching for the proper position. Hence a long focus lens, as long focus as the conditions will allow, is necessary, and one of considerable covering power so as to avoid stopping down.

It is much better to make the image of the animal small in size both because the proportions are better preserved and also because a larger diaphragm, or even full opening of lens may be employed and therefore shorter exposure; if large size is desired resort to enlargement.

We have seen a number of beautiful enlargements made in this way, which were not perceptibly inferior in detail to direct photographs of the same size and far superior in the relations of the anatomy. But sometimes one is obliged to place the camera near the animal to avoid the bars of the cage—and then there is great danger of distortion if a wide angle lens is made use of.

The color of animals and the peculiar structure of the wool or hair must be studied, and one often wishes that he might use the orthochromatic plate—and the yellow screen too—but fears to do so by reason of the restless activity of the subject.

The flash light has been very successfully employed in securing pictures of animals at home, and many a beautiful domestic scene has been further enhanced by the presence of puss or Fido in all their dignity and important relation to the family group.

HUNTING FOR PLATINUM ON THE BEACHES OF CALIFORNIA AND OREGON

A Paper by Col. William E. Barrows, read at the Stated Meeting of the Photo. Soc. of Phila., March 8, 1899

I HAVE recently made a business trip in the far West—California, Oregon, Washington, British Columbia, and the Northwest Territories—in search of platinum, and your Lantern Committee has been good enough to think that some of the snap shots that I have made to show the occurrence of platinum in the auriferous sands of the river beaches and the

Platinum Mining—Small Scale COL. WM. E. BARROWS

Pacific coast may be of interest. Some of them have no merit whatever, other than that they fairly represent the peculiarities of placer mining ; some were made from the car window ; some were made in the rain ; some were made in the very early morning, or about sunset, and others when I had all the time I wanted and everything was favorable.

Platinum was first found, I believe, in the alluvial deposits of

the river Pinto, near its mouth. The River Pinto is in the United States of Columbia, and empties into the Pacific Ocean at Choco Bay. At the present time the supply of platinum is mainly drawn from Russia. The total output of the Russian mines for the year 1897, the last for which there is a public record, was about 174,000 ounces, troy, while the platinum mined in the United States and Canada for the same period of time would be, I presume, about 500 ounces. Platinum is found in nature in the form of scales, and sometimes in the form of lumps or nuggets. It is reported that a nugget of platinum weighing 26

Washing Ore COL. WM. E BARROWS.

pounds was found in the Ural Mountains. There is also a report of the finding of a platinum nugget in South America weighing about 8 pounds. The largest nugget I have found on this trip weighs about one-half ounce. Platinum has a specific gravity a little higher than gold. Is is ordinarily non-magnetic, ductile, and is soluble only in heated aqua regia.

* * * I began my hunt for platinum in the northwestern part of California. With an ordinary shovel, a small quantity of black sand is removed from the bed of the stream

in which it is supposed that platinum may be found. This is put into a miner's pan, which is made of heavy sheet-iron, about the size and shape of an ordinary milk pan used by farmers; the pan is afterwards filled partly with water and the contents agitated so that the heavy particles of earth and sand will settle to the bottom and the lighter particles rise to the top and be floated off with the water. Small pebbles, etc., large enough to be taken out with the hand, are removed in that way, and the operation is continued until the heavy material is settled in the bottom. This heavy material will consist of iron, gold, platinum, etc., the presence of which can be determined without trouble with the naked eye. By careful use of a magnet most of the magnetic iron can be removed. Great care is necessary, however, as while pure platinum is non-magnetic, yet, as the grains are small, it may be mixed with the iron mechanically and lost. The gold is separated by the use of quicksilver. It is not necessary in performing the mechanical operation, termed panning, that a pan should be used. This operation is very frequently done with an ordinary shovel, and miners become very expert in the use of the shovel or the pan in separating the above-mentioned materials. Mining in a large way is done with water under pressure, and is termed hydraulic mining. * * * The water for this particular mine (shown in the picture) is brought about 30 miles, siphoned across a valley something over 200 hundred feet in depth, and is delivered at the nozzle at a pressure of 175 pounds to the inch. * * * The nozzle is 7½ inches in diameter. By a suitable arrangement the direction of the stream from the nozzle can be changed as desired, and the earthy bank is washed down to bed rock. * * * The large boulders are removed at proper periods, and the finer particles are carried with the waste water through a sluice or flume. The bottom of this sluice is usually paved with wood, after the ordinary method of paving streets. The interstices between the blocks of wood, however, are much greater than if the blocks were laid for street paving. In the sluice, towards the lower end, a suitable quantity of quicksilver is placed, and by the action of the water is reasonably well distributed in these interstices between the blocks, the gold that is carried down the sluice amalgamates with the quicksilver and at intervals is removed, the quicksilver and gold being then separated in the ordinary way. At the lower end of the flume

the bottom of the sluice is covered with copper plates, silvered, and any gold that may have passed the sluice without being amalgamated is retained by the copper plate. If the platinum is to be saved, the sluice beyond the part covered by copper plates is covered with a blanket and the platinum, which is ordinarily in the form of flat scales, is retained by the nap of the blanket. The iron, garnets, monozite and other heavy material, which is

Hydraulic Placer Mining, Granite Creek, B. C. COL. WM. E. BARROWS

usually round in form, is carried by the force of the water over the nap and into the dump heap below. The blanket used is made so that it be taken out at any time and the platinum beaten or shaken off onto a sheet. This is the ordinary method of saving platinum, rather crude and very wasteful. There are several devices for doing the work in a much more scientific and economical way. Platinum is ordinarily found in the beds of streams or ancient river beds, in the vicinity of serpentine or chromite rock.

* * * In hydraulic mining there is very considerable difficulty in getting rid of the earth, sand and gravel, and a few years ago there was an active and bitter fight between the farming

and mining industries in California, the principal question of politics hinging on the "Debris Law." On the east side of the Cascade Mountains no hydraulic mine is permitted without complying with the law regarding the overflowing of agricultural lands, but on the west side there are practically no farming lands, and not much attention is paid to the law. The present surface of the bed of a branch of the Trinity River is 37 feet above the original level when mining operations were started. Wherever there was a ranch the Mining Company has purchased the land from the proprietor to prevent litigation. In some mining operations, owing to the formation of the ground, it is quite difficult to get down to bed rock and have room to make the proper sluices. In some large mines extensive blasting operations have to be gone through with.

In that part of the country where my investigations were made the means of travel were by stage, by private conveyance or on the back of an animal, or on foot. The country is very mountainous and often so wild that the only method that can be adopted is to walk or go on the back of a horse or mule. In some parts there are very good roads and quite a number of toll roads, and it is fair to say that one can go over the country without unusual hardship. However, in the fall, during the rainy season, it is exceedingly muddy, and until an eastern man has had some experience he calls the road impassable. Where there are no wagon roads; the trails over the mountains, as a rule, are very narrow. A foot path or trail will vary from 6 to 15 inches in width, and it is often the case that on one side there will be a river 300 or 400 feet below and on the other side the mountain the same number of feet up. There is no particular difficulty, however, in going over such a road as this unless you pass a pack train and the animals are loaded with bulky articles. Food and sleeping accommodations cause necessarily considerable anxiety, but these matters are relative, however. For example, the food and service furnished at the hotel at Whiskey Town would be considered of very poor quality if furnished at the Bellevue, but to a tired, wet and hungry man it is very good.

* * * Travel by wagon over the roads is quite limited, and, extraordinaries excepted, it is done on horseback. We had made a long day's journey, and, about ten miles from the last house we had passed, we came to a party repairing a bridge. As it was

on the side of a very steep hill, with a very narrow road and no place to turn, we suggested that it might have been wise to put up a notice warning travelers that the road was impassable ahead, and we were told that they thought as it was in the rainy season it was a very good time to build the bridge, as no one would be likely to travel over the road for several days. They were very considerate, however, in helping us out of our difficulty, and, leaving the horse and carriage with the driver until the road

Arch Rock COL. WM. E. BARROWS

could be repaired, we walked over the trail to the ranch of the Hon. Mr. Crook, who had served three terms in the Oregon Legislature. He was a very intelligent man, had a very comfortable house, and he gave us a cordial reception. There seems to be some difficulty in farming in this section of the country, as there is no way of getting the produce to market, except by steamer, which can only go to the vicinity on the coast in September, and all the farm products that are to be sent to market during the year are sent at that time.

* * * Mr. Crook's house is near what is shown on the maps as Crook's Point, about 20 miles south of Gold Beach, where

large and extensive mining operations have been carried on for gold thrown up with the black sands, by the action of the sea, on the beach. In some way, not well understood, at each high tide black sands are thrown up on the shore. This is gathered up and put through the proper sluice and the gold saved. The miner at work at the point of the beach we were visiting stated that he had worked there and in the immediate vicinity for forty years, and that when the weather was good and the tide served right, he could make an average of $5 per day washing for gold. A large share of the beach is very rocky. The rocks, however, are of one general character, with the exception of places near the Oregon and California line, where for several miles the beach is covered with small pebbles of various colors. They are not of any particular commercial value, though some of them of good color, after being cut, find a ready sale of from 50 cents to $5. While on this part of the shore it was impossible to take a picture, owing to the rain. In going along the beach the road passes through miles and miles of redwood forests, the density of which makes it very difficult to get any pictures with a small camera. The trees are not as large as those in Mariposa, but are of very good size. * * * On the coast of Oregon there is a peculiar rock known as Arch Rock. The opening in the rock and the depth of the water in it are sufficient to allow the United States Coast Survey supply ship to pass through.

Another view shows miners at work for gold. Here the sand and gravel are shoveled from the bank and wheeled to a convenient place near the beach, where the ordinary tom, as it is called, is in operation. In this form of mining the gold-bearing material is shoveled into a box with a perforated bottom. The water is brought with pipes and hose from the surrounding country and admitted to the box, washing the finer parts of the material through the holes and over three amalgamating plates. These three plates are of copper, about 40 inches long and 18 inches wide and coated with silver. The gold amalgamates with the silver, and the other material is wasted. This wasted material interested me, as it contained all the platinum that was in the material operated upon.—*Journal Photo. Soc. of Phila.*

Three Sisters—Selkirk Mountains
Nicola Lake, B. C.

Selkirk Mountains
On the road from Nicola to Granite Creek, B. C.

LANDSCAPE

IT is not so much for want of knowledge of the essentials which make up artistic landscape as the difficulty of applying such knowledge which causes the photographer to fail so frequently in his endeavors after pictures from nature. It is salutary advice to recommend him to avoid scattering subjects, but it is difficult, even armed with this advice, for him to select from a landscape that which is best suited to the purposes of art.

There are so many objects presented to him which seem of equal consequence, each receiving an equal amount of light and shadow, that the unification so desirable seems exceedingly difficult to attain. The eye is distracted, there seems to be no contrasts, no repose in the view, no emphatic key-note to the harmony.

It is true, nature is constantly producing scene after scene, picture after picture, upon principles of the most exquisite beauty, but the cameraist is beset with innumerable difficulties in the way of obtaining them.

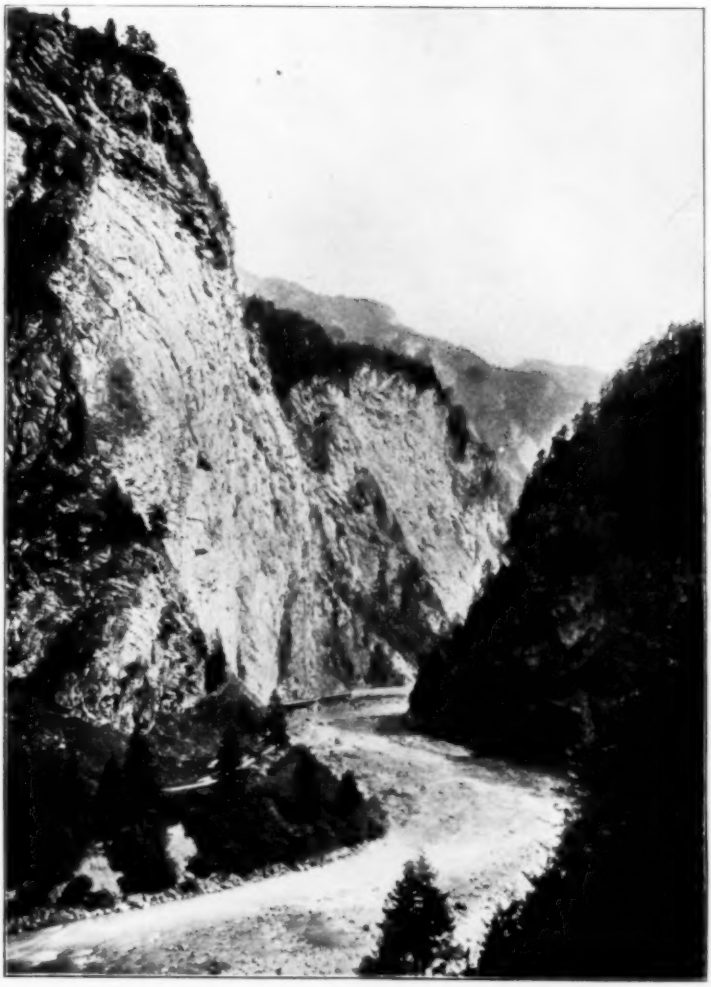
Still the photographer must know something of the constant principles upon which nature works, so as to apply them as far as possible for pictorial effect.

Grouping is one of the constant principles, or rather a universal law, and it is only on rare occasions, just enough to be the necessary exception to a general law, that scattering may contribute to the harmony of the scene.

These assemblages of objects in groups are agreeable to the eye, and, as every æsthetic law has its basis in physiological necessity, it might be accounted for by the supposition that æsthetic pleasure is a nervous impression in the line of least resistance. In other words, that co-ordination of individual impressions requires less effort to the mind than the perception of separate elements at different intervals—on the same principle that a curved line, by reference of all its elements to a common center, is more pleasing to the eye than an irregular broken line.

But, be the cause of pleasure what it may, unity in variety, the subordination of many to one, is necessary to picturesque landscape.

Balance of lines and masses contributes to the unification; and this balance may be obtained by symmetry of parts, or, by reliev-



On the Via Mala, Switzerland ELLERSLIE WALLACE, JR., M. D.

Stranded Collier FREER, YORK

ing a larger mass by a smaller mass of greater intensity and interest.

In searching for a complete landscape composition, endeavor to find one with an open centre, so that one may have a glimpse of the far-off distance which may be relieved on each side by the two masses, the one contending by greater dimensions with the other of less size, but more emphatic. Such composition leads the eye gradually into the picture, preventing too sudden a transition from the foreground to the distance.

The position to be occupied by the subject upon the plate depends upon the character of the subject. It is only when a complex and interesting foreground forms an integral part of the

Loch Katrine FROM PAINTING BY GIRTIN

view that the horizon should be struck high on the plate and the sky occupy a minor portion of the scene. This complexity of foreground, which painters of the old school of landscape used to fear as being too distractive, has been shown by the new school to be a rich source for pictorial rendering—and, no doubt, the camera has taught painters its value.

But it is not so often that one meets with an interesting foreground *per se*, and in the majority of cases grandeur is secured in landscape by striking a lower line of horizon. Flat plains and sandy beaches of the sea have a more imposing effect when the sky, even if it be void of clouds, occupies as much as three-fourths of the picture. It gives the effect of atmosphere and space. In mountain scenes, however, the horizon should be taken higher, because it gives dignity and height to the mountains. A low horizon, in such a case, dwarfs inordinately.

The transforming action of light is marvelous, and a landscape which looks common-place when the sun is nearly vertical, will seem appareled in celestial light when viewed with the sun low down upon the horizon. Much may be learned from the painters in the study of the effect of light and shade, but sometimes the light in their paintings is "a light that never was on land or sea," and not available to the photographer. Effects of illumination are heightened by attention to that which relates to peculiar arrangements and contrasts of light and dark.

It is an excellent plan to look at the view you intend to take, with the eye partially closed, so as to obliterate all detail, to get it in a so-to-say, out-of-focus condition. Or, if you choose, purposely put the view out of focus on the ground-glass, so that you may study the massing of lights and shadows. But the view the eye half closed affords is more instructive, because the lens does render one plane in sharp focus, however much one may be desirous of producing an impressionalistic landscape of the fuzz school. If the scene, under the indistinct perception the eye has of it, resolves itself into a mass of confused, distracting spots, it is not worth the exposure of a plate. But if you find, on the other hand, a mass of quiet shadow, or half shadow, relieved with deeper tones and a few very high lights of small area, you may be sure of an interesting picture.

The question of finish and detail in landscape might here arise. It is not high finish or expression of detail which is objectionable

so much as tastelessness of finish, or detail, in the wrong place. A landscape sharp all over is almost as bad as one fuzzy all over. Detail should be subordinated to general effect, and not be obtrusively presented in portions in which it is better to repress as much as possible, and whatever faking is resorted to on negative or print is legitimate if the effect of the picture is heightened thereby.

One does not account Gerard Dow great, because one is able, almost, to count the threads in his carpet, nor accuse Reynolds of a want of accuracy for merely indicating the wound in Dido's side by a slight touch of red, instead of making it so exact as to be of pathological value to the surgeon, but sickening to the man of taste. As Pope says, "Art is nature to advantage dressed;" that is, we can, in a measure, even idealize with the camera by exercising taste and judgment in the emphasis or subordination of detail in certain portions of our picture.

Much, as we have said, may be learned from the study of the painters, and better than by any attempt to construct pictures on rule, remembering that in a comprehensive sense "All nature is but art, and all chance, direction."

We have given as an example for study, a landscape by Thomas Girtin, which should be instructive to the photographer, because its beauties are in a line accessible to his camera. It is a view of one of the Scottish lakes, probably Loch Katrine. Sobred tints of exquisite truth and broad chiaroscuro are his prevailing characteristics. He loved the repose of nature and his pictures are pervaded with this tranquility—sometimes solemn evening effects, sometimes the still sunshine of noon.

This engraving of Girtin's is of exceeding beauty, which grows more and more upon us the longer we study it.

Philadelphia has ever been a home of photographic journalism, and, after a brief cessation from activity, has again taken her old position. The AMERICAN JOURNAL OF PHOTOGRAPHY, recently resuscitated, is a strong magazine, and its April issue is a wonderfully good number. It is published at 817 Filbert Street.—*The Photo-Miniature.*

The AMERICAN JOURNAL OF PHOTOGRAPHY contains much that is interesting to photographers, amateur and professional, and also to people not especially interested in photography. It is illustrated with many fine half-tones made from original photographs. Perspective and Use of Wide Angle Lens, Photographic Art Criticism, Distortion in Pictures of Interiors, Martinique, February Blizzard, Dress and Drapery, Clouds in the Photograph, Carbon Work for Amateurs, is a part of the table of contents.—*School Education, Minneapolis.*

THE YELLOW SCREEN

A. B. KOTTON

A GREAT deal of uncertainty exists as to the utility of the yellow screen or ray filter, as some call it, in connection with the use of orthochromatic plates. Is it necessary or may it be dispensed with? That is, is it of any actual benefit in securing the better rendition of color values.

Will an ordinary commercially prepared orthochromatic plate give better results without its use than a plate which is not orthochromatic?

It might seem easy enough to answer these questions by actual trials; but it is difficult to get unanimity of opinion as to what is the best results and especially in landscape work. Some are for the crisp sharply-defined effects which present the distances with distinctness of outline, a sharp line of demarkation between sky and mountain contour. Others are satisfied only when the aerial perspective is properly rendered by the artistic distortion or blurring of the distance.

There is no doubt that orthochromatic photography, though far from perfect, is a valuable factor in the rendering of color values, but very little discretion is exercised in the employment of the screen.

The opinion largely prevails that the essential in a screen is its yellowness, and it is generally applied without any assurance of the character of the results. Even amongst those who have work to do requiring orthochromatic plates we find a hesitancy whether to use or dispense with it. They seem to have no general principles to guide them, and prefer to expose both with or without, frequently declaring that they believe the removal of the yellow screen gives quite as good results; and that its presence only unnecessarily prolongs the exposure.

Mr. Frederic Ives, who is an authority on the subject, says that the particular color of the screen is not so much a matter of consideration as the selection of a suitable coloring matter. Some substances have the power to cut off certain rays of the spectrum or to greatly reduce the number which passes through them, and in this manner retard the action of such rays on the sensitive surface, giving thus an opportunity to the less active rays to operate. So that it may happen that in one's zeal to secure the

best results one may greatly err in selecting too deep a shade of yellow for the screen and so unnecessarily prolong exposure with less effective results really than could have been accomplished by a much lighter tint and shorter exposure; the nature of the lighter tint being such as to absorb a greater number of the rays it is desired to shut off.

At one of the recent meetings of the Photographic Society of Philadelphia, there was some discussion, pro and con, as to the benefits of color screens, and I believe Mr. Ives then said in reference to bichromate of potassa that it possessed the advantage over a good many others in having progressive absorptive power from the violet end of the spectrum and that if the sole object is to cut off the violet end there is nothing more effective. But as the orthochromatic plate is so constituted that it is more sensitive to the less actinic rays and less sensitive to the most actinic rays there seems to be less necessity for its use than when the ordinary plate is used, and so even with the use of the bichromate cell as a ray filter, a very slight tinge of yellow may be all that is necessary, to the great advantage of diminishing the time of exposure.

Judicious use, therefore, of the yellow screen in connection with orthochromatic plates would seem better than employment of a deep yellow screen and ordinary plates. However, there are cases when it is useless or worse than useless to employ the yellow screen in orthochromatic photography. Frequently it exalts inordinately the yellow in the object and puts it out of harmony with the scale of tints and very often its use in landscape work totally destroys all atmospheric effect. I have before me two pictures on the same card, whose object is to show by comparison the pre-eminent superiority of the one made by the use of the screen. Any one who knows what are the characteristics of artistic landscape photograpns would reverse the verdict given by the advertiser of the screen.

But, after all, in the great majority of cases of landscape, is there any so pre-eminent superiority of an orthochromatic plate alone (where the yellow screen is not essential) over an ordinary plate? I think most landscape workers will agree with me that there is not any special advantage except where one wishes special distinctness in the distance, and this is hardly an exception since in such cases one generally uses the yellow screen.

In portrait work the use of the yellow screen of the proper tone in connection with the rapid variety of orthochromatic plates gives most charming results with sallow faces ; or even with the ordinary run of complexions, and though the exposure is considerably lengthened it is not excessive and much less than that demanded in wet plate days. Portraits made in this manner need no retouching except in extreme cases, and are infinitely superior to any retouched photograph. If the makers only could produce an orthochromatic portrait plate which included in its make-up a yellow screen, it would be a consummation devoutedly to be wished.

AN APPLICATION OF THE DIFFRACTION-GRATING TO COLOR-PHOTOGRAPHY

R. W. WOOD

IF a diffraction-grating of moderate dispersion and a lens be placed to the path of a beam of light coming from a linear source, and the eye be placed in any one of the spectra formed to the right and left of the central image, the entire surface of the grating will appear illuminated with light of a color depending on the part of the spectrum in which the eye is placed. If one part of the grating has a different spacing from the rest, the spectrum formed by this part will be displaced relatively to the first ; and if the eye be placed in the overlapping part of the two spectra, the corresponding portions of the grating will appear illuminated in different colors. This principle I have made use of in the development of a new method for producing photographs in natural color. I have eliminated the use of pigments and colored screens entirely in the finished picture, the photograph being nothing more nor less than a diffraction-grating of variable spacing, the widths between the lines in the different parts of the picture being such as to cause them to appear illuminated in their proper colors when viewed in the manner described.

We will take at the start three diffraction-gratings of such spacing that the deviation of the red of the first is the same as

that of the green of the second and the blue of the third (the red, green, and blue in question being of the tints of the primary colors of the Young-Helmholtz theory of color-vision). If these three gratings be mounted side by side in front of a lens their spectra will overlap; and an eye placed in the proper position will see the first grating red, the second green, and the third blue. If the first and second be made to overlap, this portion will send both red and green light to the eye, and will in consequence appear yellow. If all three be made to overlap in any place, this place will send red, green, and blue light to the eye, and will appear white.

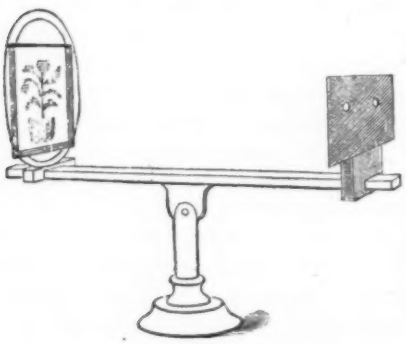
The method that I first employed to produce photographs showing natural colors on this principle is the following:— Three negatives were taken through red, green, and blue screens in the usual manner: from these positives were made on ordinary lantern slides (albumen-slides are necessary for reasons which I will speak of presently). The positives, when dry, were flowed with bichromated gelatine and dried in subdued light. The three diffraction-gratings of proper spacing, ruled or photographed on glass, were placed over these positives, and exposed to the sun or electric light for thirty seconds. On washing these plates in warm water, diffraction-gratings of great brilliancy were formed directly on the surface of the film. Albumen-plates must be used, since the warm water softens and dissolves a gelatine film. Three sheets of thin glass, sensitized with the bichromated gelatine, were placed under the three positives, and prints taken from them. The portions of each plate on which the light had acted bore the impression of the corresponding diffraction-grating, strongly or feebly impressed, according to the density of the different parts of the positives. These three plates, when superimposed and placed in front of a lens and illuminated by a narrow source of light, appear as a correctly colored picture, when viewed with the eye placed in the proper position. Perfect registration of the different parts of the picture could not be obtained in this way, for obvious reasons. I worked for a while with the thin glass from which covers for microscopical slides are made. This gave much better results, but was too fragile for practical purposes. It then occurred to me that if I could get the entire grating system on a single film, not only would the difficulty about perfect registration vanish, but the

pictures could be reproduced by simple contact-printing on chrome-gelatine plates as easily as blue prints are made. I was surprised to find that successive exposures of the same plate under the positives, perfect registration being secured by marks on the plates, produced the desired result. On washing this plate in warm water and drying, it becomes the finished colored photograph. Where the reds occur in the original, the spacing of the first grating is present; where the yellows occur the spacings of both the first and second are to be found superimposed; where the blues occur are the lines of the third grating; while in the white parts of the picture all three spacings are present. It seems almost incredible that, by exposing the plate in succession under two gratings, the spacings of both should be impressed—superimposed—in such a manner as to give the colors of each in equal intensity; but such is the fact. Thus far I have had at my disposal but two gratings of only approximately the right spacing, one giving the red, the other the green: with these I have photographed stained-glass windows, birds, and butterflies, and other still-life objects, the finished pictures showing reds, yellows, and greens in a most beautiful manner. By making a separate plate from the blue positive, using the same spacing as with the green, and setting this plate behind the other at an angle, I have obtained the blues and whites, the grating space being diminished by foreshortening, though, of course, perfect registration of the different portions of the picture could not be obtained.

One of the great advantages of this method is the facility with which duplicates can be made. If we place the finished picture in a printing-frame over a glass plate coated with bichromated gelatine, and expose it to sunlight, on washing the plate in warm water, we obtain, by a single printing process, a second color-photograph, equal to the first in every respect, and also positive. From this second copy we can print others, all being positive.

The apparatus for viewing the pictures consists of a cheap double-convex lens mounted on a little frame, as shown in Fig. 1, with a perforated screen for bringing the eye into the right position. I find that, by using a lens of proper focus, it is possible to so adjust the apparatus that the picture can be seen in its natural colors with both eyes simultaneously, since corresponding overlapping spectra are formed on each side of the central direct

image. A gas-flame turned edgewise, or the filament of an incandescent light, makes a convenient source of light. The colors are of great brilliancy and purity, almost too brilliant in fact, though dark reds and ochres are reprodnced with considerable fidelity. The pictures can be projected by employing a powerful arc-light, placing a rather wide slit in the overlapping spectra, and mounting the projecting lens beyond this. The pictures that I have obtained thus far measure 2.5 in. by 2.5 in., and have been thrown up about 3 feet square. The fact that only a small percentage of the light is utilized makes great amplification difficult. Certain experiments that I have made lead me to believe that the process can be greatly simplified.



I have exposed an ordinary photographic plate in a camera under a diffraction-grating placed in front of, and in contact with, the film. On development, we obtain a negative the dark portions of which are broken up into fine lines, corresponding to the lines of the grating; and on viewing this in the apparatus just described, the blue components of the picture are seen, though not so brilliant as with the transparent gelatine plate owing to the coarseness of the grain.

I believe that by the use of a suitable photographic plate to be exposed in succession in the camera, under red, green, and blue screens, on the surfaces of which suitable diffraction-gratings have been photographed, it will be possible to obtain the color-photograph directly. The screens can be swung into position in succession by a suitable mechanical arrangement operated outside of the camera. The plate, on development, will be a negative in the ordinary sense of the term, though when seen in the viewing-apparatus it will appear as a colored positive, since on the transparent portions which correspond to black in the original, no grating-lines have been impressed: consequently these portions will appear dark. The dark portions, however, where the lines

are impressed will light up in their appropriate colors. From this plate as many copies as are desired can be made by contact-printing on bichromated getatine.

Of course it is a question whether superimposed gratings can be impressed on a plate in this manner. Judging from the experiments I have made, I imagine that the gratings on the color-screens would have to be made with the opaque portions broad in proportion to the transparent.

I have overcome the difficulty of obtaining large diffraction-gratings by building up photographic copies in the following manner. The original grating ruled on glass was mounted against a rectangular aperture in a vertical screen, the lines of the grating being horizontal. Immediately below this was placed a long piece of heavy plate-glass, supported on a slab of slate to avoid possible flexure. A strip of glass, a little wider than the grating, sensitized with bichromated gelatine was placed in contact with the lines of the grating, and held in position by a brass spring. The lower edge of the strip rested upon the glass plate so that it could be advanced parallel to the lines of the grating, and successive impressions taken by means of light coming through the rectangular aperature. In this way I secured a long narrow grating ; and by mounting this against a vertical rectangular aperature, and advancing a second sensitized plate across it in precisely the same manner, I obtained a square grating of twenty-five times the area of the original. It was in this manner that I prepared the grating used to print the impressions on the three positives. So well did they perform, that it seemed as if it might be possible in this way to build up satisfactory gratings of large size for spectroscopic work. Starting with a 1-inch grating of 2000 lines, I have built up a grating 8 inches square, which, when placed over the object glass of a telescope, showed the dark bands in the spectrum of Sirius with great distinctness. No especial precautions, other than the use of the flat glass plate, were taken to insure absolute parallelism of the lines, and I have not had time to thoroughly test the grating. The spectra, however, are of extraordinary brilliancy ; and on the whole the field seems promising. This matter will, however, be deferred to a subsequent paper.—*London, Edinburgh and Dublin, Philosophical Magazine and Journal of Science.*

Physical Laboratory of the University of Wisconsin, Madison.

INTENSIFICATION AND TONING OF PLATINOTYPES

HERR Rapp (*Photographische Correspondenz*, April, 1899, p. 198) makes mention of a physical intensifier which is specially suited for platinotype prints, silver being deposited on the platinum image, but not on the white paper. The intensifier in question is a freshly prepared mixture of 50 c.c. water, 50 c.c. cold saturated gallic acid, ten to twenty drops of glacial acetic acid, and 2 c.c. of 10 per cent. nitrate of silver solution. When the print is sufficiently intensified it is rinsed two or three times in water acidified with acetic acid, after which the newly deposited silver can be replaced by platinum. For this purpose the print is immersed in a platinizing bath consisting of water 600 c.c., strong phosphoric acid solution 15 c.c., and chloroplatinite of potassium 1 gramme. Simple washing is sufficient after this treatment, and as the new deposit now consists merely of platinum, the tone is black, like an ordinary platinotype. If, however, the print in the first stage of intensification is subjected to such toning methods as are ordinarily available in the case of silver prints, the silver facing is altered, and almost any superficial tone required may be produced on the permanent platinum base. Thus, for example, the print after the gallic bath and rinsing in the acidified water may be treated by any of the methods depending on the formation of metallic ferrocyanides (see *Acta* for March 31st last, and April 14th last); but Herr Rapp suggests that whenever the uranium bath is used, it should be very much diluted, as otherwise the action is so rapid that the paper basis may be stained. An uranium-iron bath recommended for green or blue tones is—

Water	50 c.c.
1 to 50 ferricyanide of potassium	20 "
1 to 50 ammonia citrate of iron	10 "
1 to 50 nitrate of uranium	10 "
Glacial acetic acid	10 "

The silver-coated platinum print becomes greenish in this mixture, but by long washing in ordinary hard water, the green tends to blue by reason of the uranium. A gold-blue tone can be obtained by the following bath :

Water	1000 c.c.
Nitrate of lead	15 grm.
Sulphocyanate of ammonium	40 "
Chloride of gold solution (1 to 50)	20 c.c.

After toning in this bath the prints should be washed for one hour. The gallic intensifier mentioned above, as depositing silver on the platinotype print, may also be used to deposit more silver on a faint silver print.—*Amateur Photographer, London.*

COLORS FOR TRI-CHROMATIC PRINTING

AT a meeting of the Royal Photographic Society, Captain Abney gave a very lucid demonstration of the chief facts to be considered in selecting colors for three-color heliochromy. The primary color-sensation curves must be the basis in making the triplet of negatives, and Captain Abney showed these curves as re-determined by himself; the most notable feature in this re-determination being the extent to which the groupings overlap, the red-sensation organs being appreciably affected by nearly the whole range of the visible spectrum. The pigments most nearly corresponding to the color sensations were shown to be: (1) Vermillion, to which a small tinge of transparent blue has been given to neutralise the yellowness. (2) Emerald green. (3) True ultramarine. The projection tints, or viewing tints, for the photochromoscope should be nearly pure spectrum colors, selected to about equally stimulate the three sets of nerve fibres. The red should be taken a little below C, the green should be taken near E, but about one-tenth of the distance towards F, and the blue from the neighborhood of the blue lithium line. The printing colors for transparent pigments will be the complementaries, and these complementaries must overlap as little as possible, or the prints will be muddy and unclear. Captain Abney showed the above spectral colors and their complementaries on the screen. He also handed round a painted chart of the two triads. The most perfect triplet of negatives is to be obtained on ordinary unstained gelatino-bromide plates, as the range of sensitiveness is unbroken all through the spectrum; but this course is subject to the inconvenience of a very long exposure for the "red" negative, the relative exposures of the three being as follows:—"Blue" negative, 1; "green" negative, 8; "red" negative, 100.—*London Amateur Photographer.*

SOME OLD PRINTING PROCESSES WORTH TRYING

A. HAHN

BY way of experiment, or perhaps amusement, or maybe, after all, with the hope of modifying some of the old printing processes, so as to make them available by the light which the new photography may shed upon them, I have been ransacking the old books for forgotten formulæ and have had some very good results, which some of your readers may like to try.

Here is one worth trying which furnishes quick printing paper :

Float the paper for five minutes on a solution of Bi-Chloride of Mercury.
Saturated solution of Bi-Chloride of Mercury,...6 drachms.
Water,.....1 pint.
When dry, float in a darkened room in a silver solution, 40 grains to ounce.

The exposure required is about five seconds in sunlight, or a minute in dull weather, until a faint image is produced, then develop with

Sulphate of Iron,.....½ ounce.
Water, ...1 pint.
Glacial Acetic Acid,.....1 drachm.

Wash and fix with hypo. In place of the iron developer very dilute metol, or paramidophenol, may be used with good effect. These prints need no toning and are quite pleasing in color.

Another process, long forgotten, gives most beautiful results.

Take syrup of iodide of iron (which may be had at the apothecary), distilled water, each two drachms ; tincture of iodine, ten drops, and mix.

Brush over one side of well-glazed paper, and, after a few minutes, dry with blotting pad and then wash with nitrate of silver, one drachm ; distilled water, one ounce, and dry in dark.

Expose in a printing frame, when a latent image is formed, which all that is required to develop is a wash in pure water and preservation for a short time in the dark, varying with the degree of exposure. The exposure induces an action which is carried on in the dark.

After the image is completely evolved, the free silver is eliminated by fixing in hypo.

An exceedingly simple positive process is the chromotype discovered by Robert Hunt. It yields pictures of various colors, and would recommend itself to those who are in search of peculiar effects in color.

Good paper is washed over with sulphate of copper, about one drachm to the ounce of water, dried, and then floated on a rather strong, but not saturated, solution of bi-chromate of potassium. When dried, the paper may be preserved indefinitely in the dark.

When exposed under a negative, the action of the light produces a dull brown color, but if the action is continued long, a bleaching effect is produced. In either case, if the paper, when removed from the frame, is washed over with a solution of nitrate of silver, a very beautiful picture of a red tone is the result.

Under-exposure does not give as good results as over-exposure.

To fix these pictures, wash in pure water and fix in hypo. If water containing salt or any soluable chloride is used, the picture vanishes, but may be restored by exposure to sunshine, but, instead of the red tone, varying tones of lilac, depending upon the amount of chloride present, used in decomposing the chromate of silver.

If a neutral solution of chloride of gold is mixed with an equal quantity of bi-chromate of potassa, and paper washed over with it and quickly dried, on exposure under a negative, an image, blue or brown, is formed on the yellow ground of the paper.

This is placed in clear water and washed for several hours, all the yellow salt is washed out and the paper left beautifully white, and the image changes either to crimson, blue, brown or deep velvety black, according to the degree of exposure. These photographs are remarkably beautiful, and though their preparation is not the cheapest, are well worth the expense.

It may not be out of place to remind the printer that beautiful prints may be had on the ordinary chloride-of-silver papers, by printing up the image about half way and developing with very dilute metol or hydroquinone, to which a little gum arabic is added.

BROMIDE PRINTING

J. PERRY

I HAVE recently been working with a variety of paper which is supposed to be bromide paper, and which gives most beautiful results when certain conditions are rigidly carried out, but this special brand deports itself more like a chloride paper, with a percentage of bromide, than that which some years ago was called bromide paper, and which I think was really quite orthodox, and yielded results pleasing enough with all sorts of developing agents, indeed quite pre-eminently beautiful ones with even ferrous oxalate. It is my intention to give you the results of my working with this old-fashioned bromide paper, which the professional generally uses by reason of the shorter exposures it will allow. In order to make bromides of a uniform quality and of a good black color, it is necessary to use the greatest accuracy in exposing. A little short of the correct exposure will give a print lacking in rich detail, whilst a little too much time changes the beautiful to-be-desired black to a rusty tone.

It is vain to imagine that one may give an over-full exposure, and then by restraining the developer with bromide of potassium, evolve quite as beautiful a print as with normal exposure. Bromide of potassium may enable us to save an over-exposure and prevent the print from looking foggy and flat, but the result, after all, is unsatisfactory and the color of the image unpleasant.

When I over-expose, I prefer to modify my method of manipulation and have recourse to toning, by which means I am enabled to get much more pleasing results than with doses of bromide of potassium.

This toning may be done either before or after fixing:

DEVELOPER

a. Eikonogen,..... 50 grains.
Metol, ... 10 grains.
Sodium Sulphite,.....240 grains.
Water,..... 20 ounces.

Dissolve the sulphite of sodium in the hot water and make the solution decidedly acid with sulphuric acid or citric acid, then add eikonogen and metol.

Filter through cotton or bibulous paper :

b. Carbonate of Soda (granular),.....280 grains.
Water,..... 8 ounces.

This developer is mixed in the proportions desired, and a few drops of bromide of potassium added.

Development should not be allowed to proceed too rapidly, but if it is observed to be proceeding too rapidly add more of the 10% solution of potassium bromide. After development, if the image is not found to be of the right color, it may be brought around by toning, which is done as follows :

Ordinarily it is not necessary to subject the print to an acid-clearing solution before washing or fixing, as it may be merely rinsed off from the developer and fixed, but if toning is found to be needed, it must be cleared of any trace of developer, the presence of which would cause, on toning, a stain.

The clearing solution consists of

Nitric Acid,.....1 drachm.
Water,.....32 ounces.

The print is placed in the bath after rinsing, and allowed to remain for five minutes or so, then transferred at once to the toning bath, without washing. It takes about ten minutes for toning, the print is then washed for a few minutes and toned in

Chloride of Platinum,.....1 grain.
Water,.....20 grains.

Neutralize the chloride of platinum solution, first with carbonate of soda, to get rid of the free hydrochloric, which is always present, then add nitric acid so as to make the solution slightly acid, but the acid should not be in excess. The bath should be allowed to stand for a day, then carefully poured off.

It is best to tone before fixing, inasmuch as the presence of even a trace of hypo in the paper will interfere with toning.

If toning is had recourse to, after fixing, as sometimes is the case when we are not satisfied with the finished print, a most thorough washing of the print is demanded—an hour would not be too much in running water.

The fixing bath should not be stronger than two ounces to a pint of water, and ought always to be perfectly fresh and clean.

ACTION OF PEROXIDE OF HYDROGEN ON PHOTOGRAPHIC PLATES

IN previous papers it has been shown that certain bodies are able, in the dark, to act on a photographic plate and produce a picture. The purpose of the present communication is to show that in all the cases which have been examined, and probably in all others of a similar kind, the action which occurs is due to the presence of hydrogen peroxide. As a sensitive plate always contains moisture, and probably would be inactive if quite dry, it does not seem possible to test the truth of this statement by the total exclusion of moisture; therefore, more indirect means have to be adopted. In the following paper no attempt is made to explain the reactions which occur in the plate itself; that is a distinct question, and at present the object is to consider the means by which these changes, whatever they may be, are brought about. These changes are rendered visible by exactly the same processes as those adopted for the development of an ordinary light picture. Any of the ordinary photographic plates may be used in these experiments; but, as many of the pictures are only formed after a long exposure, it is well to use rapid plates. In the following experiments the plate used has been in almost all cases the Ilford special rapid, and the process of development has in every case been that recommended for their ordinary use.

The first step toward demonstrating that hydrogen peroxide is the active agent in producing these pictures is to show that all the results produced both by metals and by organic bodies on a photographic plate can be produced by hydrogen peroxide. This body is now made in considerable quantities and sold in aqueous solution of a given strength. This commercial article appears to act equally well to a carefully prepared and pure specimen of the same strength.

A convenient way of testing the action of any liquid on a photographic plate is to use a small circular glass dish, such as is made for bacteriological experiments, the photographic plate resting on the top of the dish, and the amount of liquid used determines the distance the plate is from the active surface, the experiment being carried on in complete darkness. If pure water be tested in this way, it is found that no picture—that is, no darkening of the plate

—occurs on its being treated with the developings olution. The plate can be left over the water for eighteen to twenty hours, but if left longer than this the film is destroyed by the aqueous vapor. If to the pure water in the dish a mere trace of hydrogen peroxide be added, a darkening of the plate will quickly occur. For instance, if the liquid contains only one part of the peroxide in a million of water, and the plate be exposed to its action for eighteen hours, a faint picture is produced. Bearing in mind the small amount of evaporation which takes place under these conditions, and consequently the minute amount of the peroxide which comes in contact with the plate, it clearly shows the exceeding delicacy of the action.

Again, if a piece of Ford blotting paper, which by itself is inactive, be wetted with a solution of one part of peroxide in 500,000 of water, and be hung up in a warm room for three-quarters of an hour to dry, and placed in contact with a photographic plate for two hours at a temperature of 55° C., on subjecting the plate to development a distinct picture is produced. In fact, moistening good blotting paper with a solution which may be strong or weak, and allowing it to dry for a long or short time, is a very good way of applying the peroxide. In place of blotting paper, any inactive porous substance may be used.

Plaster of Paris wetted with a peroxide solution and allowed to set continues for a long time to be an active body. If by any of these means a large, in place of a small, amount of the peroxide be allowed to act on a plate, then, in place of a dark, a light picture is obtained—a phenomenon similar to what is known to photographers as reversal.

The conditions under which certain metals and certain organic bodies act on photographic plates, and how pictures of the structure of paper, skeleton leaves, lace and other bodies can be obtained, has already been described, so that now it is only necessary to say that substitute for these active bodies peroxide of hydrogen and exactly corresponding results are produced. Writing with ordinary ink, or with a solution of ferrous sulphate, or potassium ferrocyanide, has been shown to be opaque to the action of zinc and of turpentine; so it is to the action of the peroxide of hydrogen. Further, the action exerted by the metals and the terpenes is unable to pass through glass, mica, selenite, etc., but is able to pass through thin sheets of gelatine, celluloid, gutta percha, India

rubber, tracing paper, gold-beaters' skin, parchment, etc.; peroxide of hydrogen acts exactly in the same way—every body which is known to be either opaque or transparent to the action of the metals or terpenes is opaque or transparent to the action of the peroxide, so that, as far as the production of similar phenomena goes, the agreement is complete. Of the acknowledged tests for the presence of hydrogen peroxide, the one with titanic acid dissolved in sulphuric acid is exceedingly delicate; so also appears to be the tetra-methyl-paraphenyl-enediamine paper of Dr. Wurstner, and both of them have been made use of.

[TO BE CONTINUED.]

LITERARY NOTES

No. 4 Journal of the Photographic Society of Philadelphia, is a most interesting number, containing the proceedings of the Society during the month of April.

The Technical Committee made a report on the action of pyrocatechine as a developer, declaring it to work cleanly and free from all tendency to stain the film, being specially adapted for the production of lantern slides, working rapidly but also easily controlled. The Committeee also offered some suggestions in regard to the use of persulphate of ammonium.

There seems to be a tendency in some cases for the reduction to take place at moderate speed for a time and then to proceed with great rapidity. It is well to keep a close watch on the operation.

The developing agent, tolidol, was also tried by the Committee. While not so rapid in the action as ortel, the samples tested developed with considerable vigor and produced negatives of good contrast and full of detail.

The solutions do not appear to oxidise rapidly and may be used a number of times without weakening. The formula used consisted of 15 grains of tolidol to 5 ozs. water.

The deposit formed is of a deep brown color of good printing quality and the operation proceeded without fog, and without staining the skin.

On April 21st, valuable papers were read by Prof. Wood, of the University of Wisconsin, on "Photographing Sound-Waves" and on a new method of "Color Photography;" the latter will be found reprinted in the present issue of the AMERICAN JOURNAL OF PHOTOGRAPHY.

Mr. Wood's method is original and theoretically sound, though not yet of practical application. It differs from all the other trichromatic methods of color photography in being an optical synthesis with a single impression.

There are a great many technical difficulties in the way of its complete success. The records are made like the other processes, but Mr. Wood shows that it is highly probable to impress the diffraction lines upon the plate by the initial exposure. If this should be accomplished, undoubtedly the method would be the nearest approach to a successful solution of the color photograph.

We learn from the English magazines of the death of Mr. W. B. Bolton, on the 12th of May.

The deceased suffered from cancer, and had recently undergone an operation, but without relief. Mr. Bolton has made many valuable contributions to the dry plate photography, his name being specially associated with the late Mr. Sayce in the production of a collodion emulsion.

His name is familiar to readers of the *British Journal of Photography*, of which he was editor from 1879 to 1885.

An important application of photography to the purpose of permanent printing in color upon fabrics which may open a new industry, was communicated to the Edinburg Photo. Soc., by Mr. Andrew Hargreaves. Prints of a deep purple and a light red color are obtained upon cotton or linen stuffs of pleasing effect.

The process of course is patented, but is said to be one of extreme simplicity and cheapness, and what is also important the colors are quite permanent the coloring matter entering the fibre of the goods.

Mr. Walter E. Woodbury, who has so successfully edited the *Photographic Times* during the past five years has joined the Nepera Paper Company to take charge, we understand, of the publication department of that extensive photographic concern.

The Australian Photographic Journal is an illustrated magazine devoted to the advancement of artistic and scientific photography throughout Australiasia. It is an ably conducted journal up-to-date containing many excellent papers and original contributions. The April number is especially interesting opening with an article entitled "Seasonable Work," which touches upon the utility and pleasure to be derived from the magic lantern. The title seems strange to us hyperboreans,—we naturally expected to hear some thing about the troubles of photographers during hot weather and the admonition to use formaldehyde or chrome alum to prevent our films running down the sink; but the concluding paragraph sounds exceedingly odd to us who are entering upon our hot season. Speaking of the use of acetylene gas for lantern work, the editor says:

"On various occasions lately we have given information regarding acetylene, its generation and effectiveness, and will take occasion during the next few months to present such further information on the subject as we think will be useful, and also on matters of general interest to users of magic lanterns, for the present contenting ourselves with having drawn attention to a subject of great interest, and one that should be taken up by photographers during the *coming winter*."

The lantern season of our photographic antipodes begins where our own ends. The Australian Journal is published in Sydney.

In Bird-Lore (The Macmillan Co.) for June, Olive Thorne Miller discusses unprejudicedly the ethics of caging birds, Lilli Lehmann sends a message to the Audubon societies, Edith Thomas and Garrett Newkirk make welcome additions to the meager list of poems relating to American birds, Mabel Osgood Wright tells how to teach children bird studies, and T. S. Roberts, Frank M. Chapman, and others contribute illustrated articles on bird-life.

According to Photo. Correspondez—the persulphate of ammonia reducer is liable to produce red fog after exposure of the reduced negative to light, and it is therefore recommended to fix out the silver remaining in the film by a return to the hypo for five minutes after first washing the plate for a short time under the tap. Of course a second washing out of the hypo is demanded.

$1 A YEAR 10 CENTS A COPY

AMERICAN JOURNAL OF PHOTOGRAPHY

AN ILLUSTRATED MONTHLY
DEVOTED TO PHOTOGRAPHY
IN ITS WIDEST SENSE

Vol. XIX JULY, 1899 No. 223

CONTENTS

PHILADELPHIA
AUSTIN C. LEEDS, Publisher
817 FILBERT STREET

NEW YORK: For Sale at BRENTANO'S, 31 UNION SQUARE

This combined developer and fixer is said to be perfectly under control by judicious dilution. It is applicable to plate films and bromide papers.

He recommends the following formula for the production of beautiful lantern slides:

Concentrated developer,	5 c. c.
Hypo solution, 1-5,	40 c. c.
Water,	10 c. c.

A perfectly clear and rich image that is developed and fixed is produced in the shortest possible time.

The Lumiere Brothers and Seyewetz report in the *Revue Suisse* the result of their experiments with a new developing agent, a definite combination of hydroquinone and paraphenylene-diamine obtained by the direct interaction of these substances. They have given it the name hydramine. In form it is a beautiful white crystalene scaly substance but sparingly soluable in cold water (1-500) more soluable in hot water. Sparingly soluable in alcohol but dissolves readily in alkaline solutions or acids. The solution in alkalis changes on exposure to the air to a brown color but this change is retarded by sulphite of soda. With most of the alkalis the development is slow and the image evolved flat and weak. The only alkali acting with energy giving good results is found to be caustic lithia.

Very small quantities of lithia added to the sulphite solution of hydramine greatly augment its power as a developer.

The best formula is found to be

Hydramine,	5 grammes.
Sodium sulphite (anhyd. cryst.),	16 "
Caustic lithia,	3 "
Water,	1000 c. c.

The solution produced a negative rich in gradation and of quick action and one that could be brought to any degree of intensity. The solution keeps clear for a long time.

The hydramine developer is especially sensitive to the action of bromide of potassium. 1 c. c. of a 10% solution had a marked action on 100 c. c. of developer—by which it will be seen that this developer is especially adapted for over-exposed plates.

Kruxo Developing Paper.—Kruxo is a practical and absolutely permanent developing paper made in two grades—Mat, which has a smooth, fine-grained surface; and Glossy, which can be squeegeed, or takes a fine burnish. Its beautiful tones are variable at will from black to olive, is very simple in manipulation and no dark-room is required.

Sensitol is a one-solution sensitizing liquid which may be applied with a brush on any absorbent material, such as paper, (postal cards, menus), silk, linen, cotton, leather, wood, stone, etc., and a fine photographic surface ready for printing from any negative; giving beautiful images of brilliant color, which can be developed in ordinary cold water and fixed in plain hypo, yet by the additional use of any of the standard toning solutions, a great variety of colors may be obtained.

CONVENTION DATES

National Convention :

Celoron, Chautauqua, July 17th to 22nd.
Secretary, George B. Sperry.

Missouri Convention :

St. Louis, Mo., August 22nd, 23rd, and 24th.
Secretary, A. S. Robertson, St. Louis, Mo.

Ohio Association :

Put-In-Bay, O., August 30th and 31st, September 1st.
Secretary, C. S. Bateham, Norwalk, O.

Photographers' Club of New England :

Boston, Mass., October 5th and 6th.
Secretary, G. E. Putnam.

The International Photogrophic Exposition :

New York, October 21st to 28th.

Philadelphia Photographic Salon :

October 22nd to November 19th.

SCHLOSS, ELTZ—GERMANY DR. ELLERSLIE WALLACE, JR.